عنوان مقاله:

Effect of Cooling Rate and Grain refinement on the Thermal and Thermodynamic Characteristics of Al-Cu Alloys

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خلاصه مقاله:

The Al-Cu alloys have been widely used in aerospace, automobile, and airplane applications. Generally Al–Ti and Al–Ti–B master alloys are added to the aluminium alloys for grain refinement. The cooling curve analysis (CCA) has been used extensively in metal casting industry to predict microstructure constituents, grain refinement and to calculate the latent heat of solidification. The aim of this study is to investigate the effect of cooling rate and grain refinement on the thermal and thermodynamic characteristics of Al-Cu alloys by cooling curve analysis. To do this, Al-Cu alloys containing 3.7, and 4.8wt% Cu were melted and solidified with 0.04, 0.19, 0.42, and 1.08K/s cooling rates. The temperature of the samples was recorded using a K thermocouple and a data acquisition system connected to a PC. Some samples were modified by Al-5Ti-1B to see the effect of grain refinement on the aforementioned properties. The .experimental results were compared to the theoretical analysis and discussed

کلمات کلیدی:

Thermal Analysis; Computer-Aided Cooling Curve Analysis; Grain Refinement; Latent Heat